REMARKS

Claims 1-33 are pending in the present application. By this Amendment, the specification has been amended. Applicants respectfully request reconsideration of the present claims in view of the foregoing amendment and the following remarks.

I. Formal Matters:

Objection To The Specification

Applicants have amended the specification as shown above to correct the Example numbers on page 55. Withdrawal of the objection to the specification is respectfully requested.

II. Prior Art Rejections:

Claim Rejections Under 35 U.S.C. §103(a)

Rejection of Claims 1-13, 18-21, 23 and 26-30 In View Of Held In Combination With Savu

Claims 1-13, 18-21, 23 and 26-30 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,852,075 to Held (hereinafter, "Held") in view of International Publication No. WO 01/30873 to Savu et al. (hereinafter, "Savu"). This rejection is respectfully traversed for at least the reasons given in paper no. 12 (Applicants' Amendment and Response filed on May 27, 2003 in response to the February 27, 2003 Office Action).

Rejection of Claims 1-13, 18-23 and 26-30 In View Of Pearlstine In Combination With Savu

Claims 1-13, 18-23 and 26-30 are rejected under 35 U.S.C. §103(a) as being unpatentable over European Patent Application No. 0974626 A1 to Pearlstine et al. (hereinafter, "Pearlstine") in view of Savu. This rejection is respectfully traversed for at least the reasons given in paper no. 12.

Rejection of Claims 1-17, 19-29 and 33 In View Of Caiger In Combination With Savu

Claims 1-17, 19-29 and 33 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,114,406 to Caiger et al. (hereinafter, "Caiger") in view of Savu. This rejection is respectfully traversed for at least the reasons given in paper no. 12.

Rejection of Claims 1-13, 15-23 and 26-30 In View Of Breton In Combination With Savu

Claims 1-13, 15-23 and 26-30 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,863,320 to Breton et al. (hereinafter, "Breton") in view of Savu. This rejection is respectfully traversed for at least the reasons given in paper no. 12.

Rejection of Claims 1-13, 15-30 and 33 In View Of Smith In Combination With Savu

Claims 1-13, 15-30 and 33 are rejected under 35 U.S.C. §103(a) as being unpatentable over International Publication No. WO 99/07796 to Smith (hereinafter, "Smith") in view of Savu. This rejection is respectfully traversed for at least the reasons given in paper no. 12.

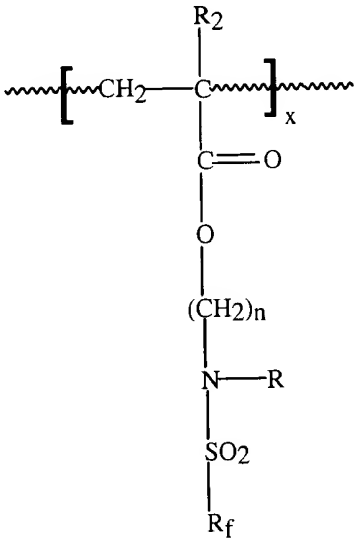
Rejection of Claims 31-32 In View Of Smith, Held, Pearlstine, Caiger or Breton In Combination With Savu and Adkins

Claims 31-32 are rejected under 35 U.S.C. §103(a) as being unpatentable over Smith, Held, Pearlstine, Caiger or Breton in view of Savu, and further in view of U.S. Patent No. 6,113,679 to Adkins et al. (hereinafter, "Adkins"). This rejection is respectfully traversed for at least the reasons given in paper no. 12.

Applicants' Claimed Invention

Applicants' claimed invention, as embodied in independent claim 1, is directed to an inkjet ink composition comprising, *inter alia*, a colorant; a vehicle; and a fluorochemical

surfactant; wherein the fluorochemical surfactant comprises one or more surfactants having one or more chemical structures selected from:



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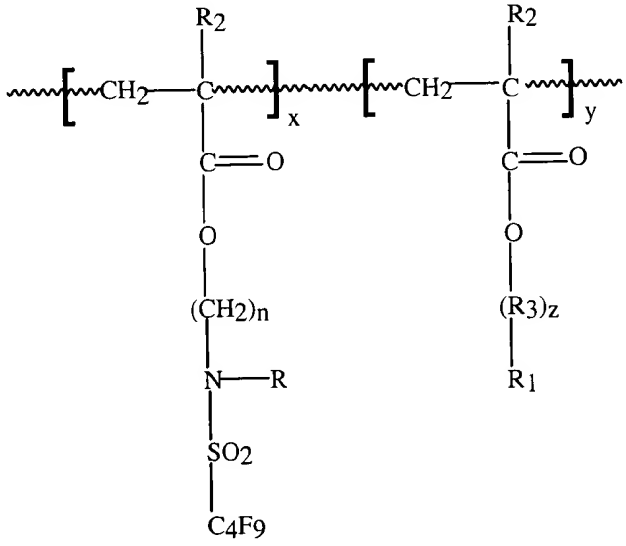
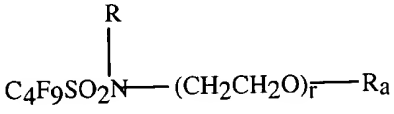


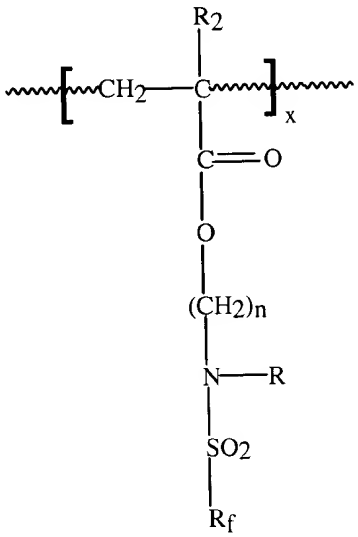
and



wherein ~~~~ represents a bond in a polymer chain; R_f is $-C_4F_9$ or $-C_3F_7$; R, R_1, R_2 and R_a are each independently hydrogen or alkyl groups having 1 to 4 carbon atoms; R_3

comprises one or more straight or branched polyalkylene-oxy groups having 2 to 6 carbon atoms in each group; n is an integer from 2 to 10; x, y and z are integers of at least 1; and r is an integer of 2 to 20.

Applicants' claimed invention, as embodied in independent claim 33, is directed to an ink jet printable radiation curable composition comprising, *inter alia*, a vehicle comprising a polymerizable material; a photoinitiator; and a fluorochemical surfactant; wherein no colorant is present; and further wherein the fluorochemical surfactant comprises one or more surfactants having one or more chemical structures selected from:



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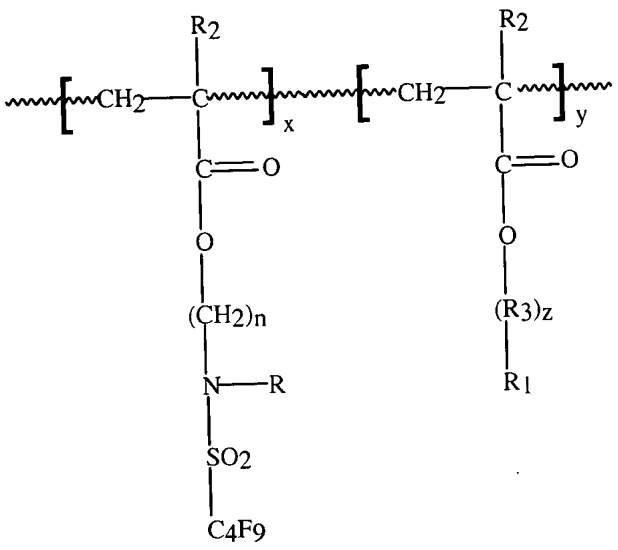
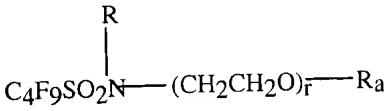


and



wherein ~~~~ represents a bond in a polymer chain; R_f is $-C_4F_9$ or $-C_3F_7$; R, R_1, R_2 and R_a are each independently hydrogen or alkyl groups having 1 to 4 carbon atoms; R_3 comprises one or more straight or branched polyalkylene-oxy groups having 2 to 6 carbon atoms in each group; n is an integer from 2 to 10; x, y and z are integers of at least 1; and r is an integer of 2 to 20.

As discussed in the "Background of the Invention" section of Applicants' specification, fluorinated surfactants have been known as effective materials for providing desirable performance requirements and surface wetting characteristics. However, the problem of foaming in ink jet ink applications is still a problem even when using known fluorinated surfactants. See Applicants' specification, from page 1, line 23 to page 2, line 12. Applicants' present invention addresses the undesirable problem of foam generation in ink jet ink compositions due to the use of known fluorinated surfactants.

Applicants of the present invention were the first to discover that specific fluorochemical sulfonamide surfactants (also referred to herein as "C_4 fluorinated surfactants" due to the presence of four carbon atoms in the fluorinated moiety) may be used in ink jet ink applications without generating undesirable levels of foam. Applicants of the present invention

were the first to use the specific C_4 fluorinated surfactants, as featured in claims 1 and 33, in ink jet ink compositions and ink jetting methods. Further, Applicants of the present invention were the first to discover that specific C_4 fluorinated surfactants were superior to known fluorinated surfactants because the specific C_4 fluorinated surfactants did not generate foam as did the previously used and known fluorinated surfactants.

The Cited Art

The disclosures of Held, Pearlstine, Caigar, Breton and Smith are directed to known surfactant systems for ink jet ink compositions, the same "known" surfactant systems described in the "Background of the Invention" section of Applicants' specification. Each of the disclosures of Held, Pearlstine, Caigar, Breton and Smith fail to teach or suggest Applicants' claimed invention embodied by independent claims 1 and 33, as well as, dependent claims 2-32, which depend from independent claim 1.

As discussed in paper no. 12 (Applicants' Amendment and Response filed on May 27, 2003), each of the disclosures of Held, Pearlstine, Caigar, Breton and Smith fails to teach or suggest (1) the specific C_4 fluorinated surfactants featured in Applicants' claims 1 and 33; and (2) the use of the specific C_4 fluorinated surfactants in ink jet ink compositions or ink jetting methods. Instead, each of the disclosures of Held, Pearlstine, Caigar, Breton and Smith discloses known specific surfactant systems, which either contain (i) fluorinated surfactants containing fluorinated alkyl group having from 6 to 22 carbon atoms, (ii) siloxane surfactants, or (iii) a combination thereof.

Examiner Berman realizes that each of the disclosures of Held, Pearlstine, Caigar, Breton and Smith fails to teach or suggest (1) the specific C_4 fluorinated surfactants featured in Applicants' claims 1 and 33; and (2) the use of the specific C_4 fluorinated surfactants in ink jet ink compositions or ink jetting methods. Examiner Berman seeks out the teaching of Savu to allegedly cure the above-noted deficiencies in the disclosures of Held, Pearlstine, Caigar, Breton and Smith.

The disclosure of Savu is directed to fluorochemical sulfonamide surfactants. The disclosed fluorochemical sulfonamide surfactants are identical to those recited in Applicants'

independent claims 1 and 33. In fact, the disclosure of Savu, which is assigned to The 3M Company, the assignee of the present application, is specifically incorporated by reference into the present application on page 13, lines 19-23 of Applicants' specification.

Examiner Berman maintains that one of ordinary skill in the art, given the teaching of any one of Held, Pearlstine, Caigar, Breton and Smith, would have (1) sought out a substitute surfactant system for the disclosed surfactant systems due to one or more shortcomings associated with the disclosed surfactant systems in the teachings of Held, Pearlstine, Caigar, Breton and Smith; (2) discovered the teaching of Savu directed to foam-generating surfactant systems in areas of technology other than ink jet ink technology; and (3) substituted the surfactant system disclosed in Savu for the disclosed surfactant systems in the teachings of Held, Pearlstine, Caigar, Breton and Smith. Applicants disagree.

Arguments

Applicants respectfully submit that one of ordinary skill in the art, given any one of the teachings of Held, Pearlstine, Caigar, Breton and Smith, would not have sought out the teaching of Savu as suggested by Examiner Berman, and then substituted the disclosed surfactant system of Savu for the disclosed surfactant systems in the teachings of Held, Pearlstine, Caigar, Breton and Smith. Examiner Berman contends that one of ordinary skill in the art would have been motivated to (i) seek out the teaching of Savu, and (ii) make such a substitution.

Examiner Berman specifically states on page 2, lines 4-7 of the July 22, 2003 Office Action:

> Applicant argues that the primary references do not provide motivation to substitute other surfactants for those disclosed. This argument is not persuasive *because each of the primary references teaches using perfluorinated surfactants in ink jet ink compositions, thus providing motivation to employ perfluorinated surfactants in the disclosed ink compositions.* (Emphasis added.)

Applicants have argued, and continue to argue, that none of the teachings of Held, Pearlstine, Caigar, Breton and Smith suggest to one of ordinary skill in the art or provide motivation to one of ordinary skill in the art **to substitute the specific C_4 fluorinated**

surfactants featured in Applicants' claims 1 and 33 for the surfactant systems disclosed in the teachings of Held, Pearlstine, Caigar, Breton and Smith. Applicants have not argued, and do not presently argue, that the teachings of Held, Pearlstine, Caigar, Breton and Smith fail to suggest to one of ordinary skill in the art or provide motivation to one of ordinary skill in the art to use C_6 to C_{22} fluorinated surfactants, only that the teachings of Held, Pearlstine, Caigar, Breton and Smith fail to suggest to one of ordinary skill in the art or provide motivation to one of ordinary skill in the art to use **the specific C_4 fluorinated surfactants featured in Applicants' claims 1 and 33**. Applicants have noted above that each of the teachings of Held, Pearlstine, Caigar, Breton and Smith disclose surfactant systems for ink jet ink compositions, wherein the disclosed surfactant systems comprise (i) fluorinated surfactants containing fluorinated alkyl group having from 6 to 22 carbon atoms, (ii) siloxane surfactants, or (iii) a combination thereof. However, the teachings of Held, Pearlstine, Caigar, Breton and Smith do not teach or suggest the use of specific C_4 fluorinated surfactants as featured in Applicants' claimed invention.

Examiner Berman continues to argue that one of ordinary skill in the art would have been motivated to seek out the teaching of Savu, and substitute the surfactants of Savu into the ink jet ink compositions disclosed in the teachings of Held, Pearlstine, Caigar, Breton and Smith by stating on page 2, lines 7-15 of the July 22, 2003 Office Action:

> Savu et al teach perfluorinated surfactants considered to be analogous in structure and having the same function as the surfactants disclosed by the primary references. Savu et al specifically teach that surfactants derived from perfluorobutanesulfonyl fluoride have surface activities that surprisingly rival the surface activities of homologs made from perfluorooctane segments such as perfluorooctanesulfonyl fluoride (page 2, lines 13-16). Thus, one of ordinary skill in the art at the time of the invention would have been motivated to substitute that surfactants containing perfluorobutanesulfonyl groups for surfactants containing perfluorooctanesulfonyl groups by a reasonable expectation of successfully providing an ink jet ink and also by an expectation of providing the advantageous surface activities taught by Savu et al.

Applicants disagree that the teaching of Savu discloses "perfluorinated surfactants considered to be analogous in structure and having the same function as the surfactants disclosed by the primary references" as stated by Examiner Berman. The teaching of Savu clearly

distinguishes perfluorobutanesulfonyl surfactants from other fluorinated surfactants by (i) the chemical structure of the surfactants, and (ii) the chemical properties of the disclosed surfactants. More importantly, there is no suggestion in the teaching of Savu that the disclosed surfactants are "analogous in structure" or "having the same function" as surfactants disclosed in the primary references, namely, the teachings of Held, Pearlstine, Caigar, Breton and Smith. It is important to note that any comparison of one surfactant with another surfactant in the teaching of Savu is not comparing the use of one surfactant in an ink jet ink composition versus the use of another surfactant in an ink jet ink composition. As discussed above, and central to Applicants' arguments, is the fact that the teaching of Savu is not concerned with ink jet ink compositions, surfactants for use in ink jet ink compositions, or chemical properties of surfactants for use in ink jet ink compositions.

Applicants want to be clear about the arguments made with regard to the proposed combination of any one of the teachings of Held, Pearlstine, Caigar, Breton and Smith with the teaching of Savu. First, Applicants respectfully submit that one of ordinary skill in the art would not have sought out the teaching of Savu, which is not directed to the art of ink jet ink technology, given any one of the teachings of Held, Pearlstine, Caigar, Breton and Smith, which are directed to the art of ink jet ink technology. As stated in Applicants' May 27, 2003 Amendment and Response, it is not clear to Applicants why one of ordinary skill in the art would have sought out the teaching of Savu when the teaching of Savu is outside the scope of the art of ink jet ink technology. That is the first question that must be asked when analyzing Examiner Berman's proposed combination of references. Second, what does the teaching of Savu suggest to one of ordinary skill in the art of ink jet ink technology?

Why one of ordinary skill in the art, given any one of the teachings of Held, Pearlstine, Caigar, Breton and Smith directed to ink jet ink compositions (i) seek out the teaching of Savu, which is not directed to the art of ink jet ink technology, and (ii) then substitute a C_4 fluorochemical sulfonamide surfactant as disclosed in the teaching of Savu for a C_6 to C_{22} fluorinated surfactant in the surfactant systems disclosed in the teachings of Held, Pearlstine, Caigar, Breton and Smith? Applicants respectfully submit that the only motivation for seeking out the teaching of Savu and then modifying the teachings of Held, Pearlstine, Caigar, Breton and

Smith has been deemed from a review of Applicants' invention, not from what is being taught or suggested in the art of ink jet ink technology.

Further, even if one of ordinary skill in the art of ink jet ink technology was directed to the teaching of Savu, why would one of ordinary skill in the art substitute a foam-generating surfactant as disclosed in the teaching of Savu into an ink jet ink composition of Held, Pearlstine, Caigar, Breton or Smith knowing that the generation of foam in ink jet ink compositions is a serious problem in the art of ink jet ink technology? Applicants respectfully submit that one of ordinary skill in the art, given the disclosure of Savu, would have been directed away from such a substitution given that the teaching of Savu highlights the generation of foam using the disclosed surfactants. Again, the only motivation for substituting a surfactant, such as those disclosed in the teaching of Savu, for the surfactants disclosed in the ink jet ink compositions of Held, Pearlstine, Caigar, Breton and Smith has been deemed from a review of Applicants' invention, not from what is being taught or suggested in the teaching of Savu.

As discussed in Applicants' May 27, 2003 Amendment and Response, the disclosure of Savu teaches away from the use of the disclosed fluorochemical sulfonamide surfactants in ink jet ink applications due to their ability to generate foam. It is well known in the art of ink jet ink technology that components are not added to ink jet ink compositions in order to produce foam. On the contrary, antifoam additives are a common additive to, and are usually a necessary additive to ink jet ink compositions so as to minimize the generation of foam during storage, handling and jetting of ink jet ink compositions. As disclosed on page 22, lines 7-25, the teaching of Savu discloses the positive attributes of the disclosed fluorochemical sulfonamide surfactants, namely, the ability to form a stable foam, when used in the oil industry. Applicants further note independent claim 69 of Savu directed to a method of forming a stable foam.

Applicants respectfully submit that one of ordinary skill in the art of ink jet ink technology, given the teaching of Savu, would not have incorporated the disclosed fluorochemical sulfonamide surfactants of Savu into an ink jet ink composition, such as the ink jet ink compositions of Held, Pearlstine, Caigar, Breton and Smith.

Examiner Berman maintains that the teaching of Savu does suggest the use of the disclosed surfactants in ink jet ink compositions. Addressing Applicants' argument that the

teaching of Savu actually teaches away from the use of the disclosed surfactants in ink jet ink compositions, Examiner Berman states on page 2, lines 17-23 of the July 22, 2003 Office Action:

> This argument is not persuasive because Savu et al teach that the disclosed surfactants are advantageous to use in place of homologs made from perfluorooctane segments such as perfluorooctanesulfonyl fluoride (POSF) (page 2, lines 13-25). Several methods of use are taught, including oil well stimulation additives and coating additives in coating applications, wetting agents or additives in photoresists, and leveling agents for resist inks and other inks (page 25, lines 17-27). Thus, although ink jet inks are not specifically mentioned, use in ink formulations is clearly suggested.

As stated above, the teaching of Savu compares the use of perfluorobutanesulfonyl-containing surfactants with perfluorooctanesulfonyl fluoride (POSF) surfactants in compositions other than ink jet ink compositions. Examiner Berman acknowledges that the teaching of Savu fails to teach or suggest ink jet ink compositions; however, Examiner Berman maintains that the disclosure of Savu suggests to one of ordinary skill in the art of ink jet ink technology that perfluorobutanesulfonyl-containing surfactants would provide desired properties in ink jet ink compositions such as those disclosed in the teachings of Held, Pearlstine, Caigar, Breton and Smith. Applicants disagree for at least the reasons given above.

It should be noted that the teaching Savu teaches the use of the disclosed surfactants in specific ink compositions, namely, "resist inks for electronics and semiconductors," "inks such as gravure coat, screen print and thermal print" inks, and "pen inks." See, Savu, page 25, lines 17-27. Clearly, the teaching of Savu does not teach or suggest ink jet inks, which differ substantially from the above-mentioned inks in both ink composition, but more importantly, in methods of applying the inks.

In Applicants' May 27, 2003 Amendment and Response (and in the present Amendment and Response), Applicants respectfully submit that one of ordinary skill in the art of ink jet ink technology would not have expected the foam-generating surfactants disclosed in the teaching of Savu to be suitable for use in ink jet ink compositions such as those disclosed in the teachings of Held, Pearlstine, Caigar, Breton and Smith. In response, Examiner Berman states on page 3, lines 1-8 of the July 22, 2003 Office Action:

> Applicant argues that the surfactants taught by Savu et al would not have been expected to be suitable for use in ink jet applications due to their ability to form foam. This argument is not persuasive because the example given by Savu et al of foam stability involves adding heptane to an acrylate composition to obtain a stable sea water foam upon shaking. Savu et al do not teach or suggest that the disclosed surfactants will cause foaming of ink compositions. One of ordinary skill in the art at the time the invention would not have been motivated to obtain a foam in a ink jet ink composition in the absence of foaming agent. Savu et al do not teach or suggest foaming other kinds of compositions than those in Examples 52-56.

Examiner Berman seems to be suggesting that the teaching of Savu only discloses the foam-generating property of the disclosed surfactants in connection with a heptane-containing solution. Applicants disagree. Applicants note that independent claim 69 of Savu is directed to a method of generating a stable foam comprising, *inter alia*, adding one of the disclosed surfactants to a "water or an aqueous dispersion or solution," not a heptane-containing solution.

For at least the reasons given above, Applicants respectfully submit that one of ordinary skill in the art of ink jet ink technology would not have combined the teachings of Held, Pearlstine, Caigar, Breton and Smith with the teaching of Savu absent impermissible hindsight reasoning. Further, for at least the reasons given above, Applicants respectfully submit that one of ordinary skill in the art of ink jet ink technology would not have substituted the surfactant system disclosed in the teaching of Savu for any of the surfactant systems in the teachings of Held, Pearlstine, Caigar, Breton and Smith given the foam-generating property of the surfactants disclosed in the teaching of Savu.

Applicants respectfully submit that a *prima facie* case of obviousness has not been made with regard to the rejection of claims 1 and 33 in view of the teachings of Held, Pearlstine, Caigar, Breton and Smith in combination with the teaching of Savu. Since claims 2-32 depend from independent claim 1, and recite additional claim features, Applicants respectfully submit that a *prima facie* case of obviousness has not been made with regard to the rejection of claims 2-32 in view of the teachings of Held, Pearlstine, Caigar, Breton and Smith in combination with the teaching of Savu. Accordingly, Applicants respectfully request withdrawal of this rejection.

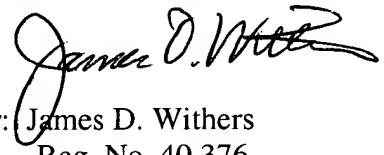
III. Conclusion:

For at least the reasons given above, Applicants submit that claims 1-33 define patentable subject matter. Accordingly, Applicants respectfully request allowance of these claims.

No additional fees are believed due; however, the Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, to Deposit Account No. 13-2725.

Should the Examiner believe that anything further is necessary to place the application in better condition for allowance, the Examiner is respectfully requested to contact Applicants' representative at the telephone number listed below.

Respectfully submitted,
MERCHANT & GOULD, LLC



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